Hamilton Institute

Oscillation and Periodicity in Stochastic Systems

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Abstract

The talk surveys recent and on-going work on oscillatory and almost periodic solutions of stochastic differential systems. The theme of the talk is to determine sharp conditions for noise induced oscillation to occur. A facet of this work is that limiting versions of these systems may be non-oscillatory, even though the systems are themselves oscillatory. Therefore, the stochastic oscillation is in some sense a singular phenomenon. Difficulties arise in analysis owing to the non-differentiability of sample paths, but these difficulties are often surmounted by introducing a shadow system which has differentiable sample paths.

Mathematical applications to classical planar systems which are stochastically perturbed include both non-hyperbolic systems (such as the nonlinear oscillator) and hyperbolic systems (such as those with a supercritical Hopf bifurcation). We also consider the oscillation of stochastic equations with delay, with a view to modelling inefficient financial markets.

The work presented is joint with C<F3>nall Kelly (BCRI, UCC), James Gleeson (UCC), Alexandra Rodkina (UWI, Kingston, Jamaica) and Xuerong Mao (Strathclyde).

Venue: Seminar Room, Hamilton Institute, Rye Hall,
NUI Maynooth

Time: 1.00 - 2.00pm (followed by tea/coffee)

Travel directions are available at www.hamilton.ie

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